**Software Design Document**

**Database Query Automation**

Models

Answer

* belongs to Question
* belongs to Section
* belongs to Student
* belongs to Knowledge\_Topic

Importing

* Import Spreadsheet files
* Two loops for each student in the file
* First loop(common for every student)
  + obtain learning outcomes for each student
  + For each year
  + Student learning outcome
* Second loop
  + Based on knowledge topics
* Importing quiz
* Importing class Quiz result
* Check Initial experience
* Record for Demographic Info
  + crn
  + uid
  + First Name
  + Last Name
  + gender
  + academic Progress
  + ethnicity
* Record for Program Of Study
  + uid
  + crn
  + programs of study
* Setting up of above mentioned field into the database
* Loading the previous years data
* generation of questions
* saving the response
* Additional quiz based on the demographics
* marking the correct responses
* saving the scores, grading
* Comparison of current grades with the previous grades
* Looping for all the students in the file

Knowledge Topics

* has many answers
* has many slo covered knowledge topics
* has many learning outcomes
* through slo covered by knowledge topics

peo covered by slo

* belong to student learning outcome
* belong to program educational objective

Prerequisite

* belong to section
* belong to student

Program Educational Objective

* has many peo covered by slos
* has many learning outcomes
* through peo covered by slos

Program of study

* belong to section

Question

* has many answers

Result

* combining all the results differentiated by their respective titles
* take data for every semester fall, spring, summer
* insert percentage of marks
* arrange according to the student id
* convert percentages into grades
* convert these percentages into graphs
* determine grades per class

Section

* belongs to student
* has many answers
* has many programs of study
* has many prerequisite

slo covered by Knowledge topics

* belongs to student learning outcome
* belongs to knowledge topic

Student

* has many answers
* has many prerequisite
* has many sections

Student learning outcome

* has many peo covered by slos
* has many program educational objectives
* peo covered by slos
* slo covered by Knowledge Topics
* through slo covered by kts

Controllers

Answers

* index - display all answers
* show - display individual answer
* new - create new answer
* edit - edit answer
* create - save new answer
* update - save edits to an answer
* destroy - delete an answer

Knowledge Topics

* same as above, but for kts

PEO Covered by SLOs

* same as above

Prerequisites

* same as above

PEOs

* same as above

Program of Studies

* same as above

Questions

* same as above

Results

* index
* answers
* search - search answers by query
  + see the query processing section of this document for more details
* abetReport - generates abetReport for viewing
  + see the standardized Report section of this document for more details

Sections

* same as Questions

SLO Covered by KTs

* same as above

Student Learning Outcomes

* same as above

Students

* same as above

Application Controller

* preventative measure against csrf attacks

Importing Controller

* loadQuiz - import quiz data
* loadSlo - import SLO data
* loadIRreport - import IRreport
* loadSloCoveredByKt - import slos covered by kts

Views

Answers

Homepage

Importing

Knowledge Topics

Layouts

peo covered by slos

prerequisite

program educational objectives

program of studies

questions

Results

Sections

slo covered by kts

Student learning outcomes

students

Standardized Report

* Currently using highcharts API to visualize data.
* Visualizations can be in the form of side-by-side histograms, stacked histograms, or parallel coordinates.
* Display all relevant data for the selected time frame in both tabular and visual forms.
  + SLOs by type, for each semester (correct & incorrect)
  + Course grades based on student pathways
  + # of students who took a course with respect to a previous course taken
  + Knowledge topics (correct & incorrect)
  + Questions (correct & incorrect)
  + Distribution of grades with respect to regular lecture vs. SCALE-UP
    - Note lecture vs. SCALE-UP information has not been provided to us as of yet.
  + Course preparedness with respect to regular lecture vs SCALE-UP
    - How to judge course preparedness?
  + Student retainment based on course/preparedness pathways.
  + Course preparedness for specific courses.
* Metadata about/within the report. Since this is a standardized report, most text can be static. Things like dates/times will dynamically change.

Query Processing

* Mapping a domain to a range
  + eg. grades mapped to # of students
  + eg. slos mapped to # correct answers AND # incorrect answers
* Filters to further specify domain and range
  + eg. grades mapped to # of students filtered to semester Spring 2014
  + eg. slos mapped to # correct answers AND # incorrect answers filtered to semester Spring 2014
* Filters may also be use to organize data
  + eg. grades mapped to # of students filtered by courses
  + eg. slos mapped to # correct answers AND # incorrect answers filtered by semesters
* All of the above may be combined
  + eg. grades mapped to # of students filtered to semester Spring 2014 AND A grades AND B grades AND female students filtered by CS courses
* Query results will be displayed in both tabular and histogram form. (parallel coordinates if possible?)
* All ranges should either be a count or a percentage.

Components to be Implemented

User Interfaces - Jeremy

Assessment Document Parsing & Data Storage - Devanshu

Query System - Daniel

Standardized Report Generation - Ramya

Data Visualization - Rami